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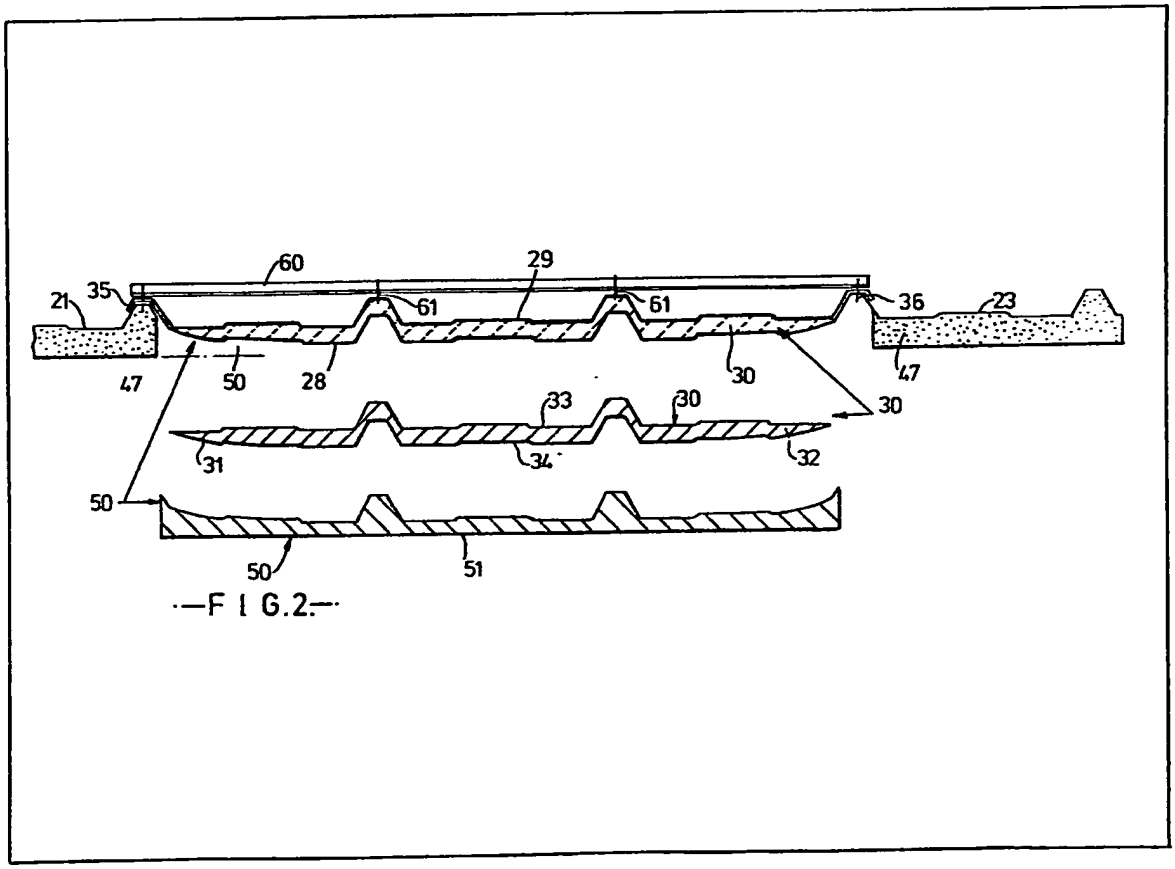
(71) Applicants H. H. Robertson Company, Two Gateway Center, Pittsburgh, Pennsylvania 15222, United States of America
(72) Inventor Neil Patrick Rewse Johnstone
(74) Agents Roystons, 531 Tower Building, Water Street, Liverpool L3 1BA

(54) Double-layer natural light fittings

(57) A double-layer natural light is made on site in a prepared normally substantially rectangular gap in main cladding of or for a building using rigid or semi-rigid transparent or translucent plastics sheeting and exploiting the flexibility thereof. Inner and outer layers (28, 29) of sheeting have interposed spacers (30), advantageously with all profiles matching the main cladding. Ends of the spacers are tapered (31, 32) so that sides of the plastics sheeting can be brought together and secured jointly to or with the main cladding. The inner plastics sheet is laid on packings (51) profiled to match the underside of the spacers (30) with at least alternate ones of which they register and are secured to purlins or other frame members of the building. Deflection limiting bars (60) are also shown fixed across the gap in register with spacers not underlaid by packings.



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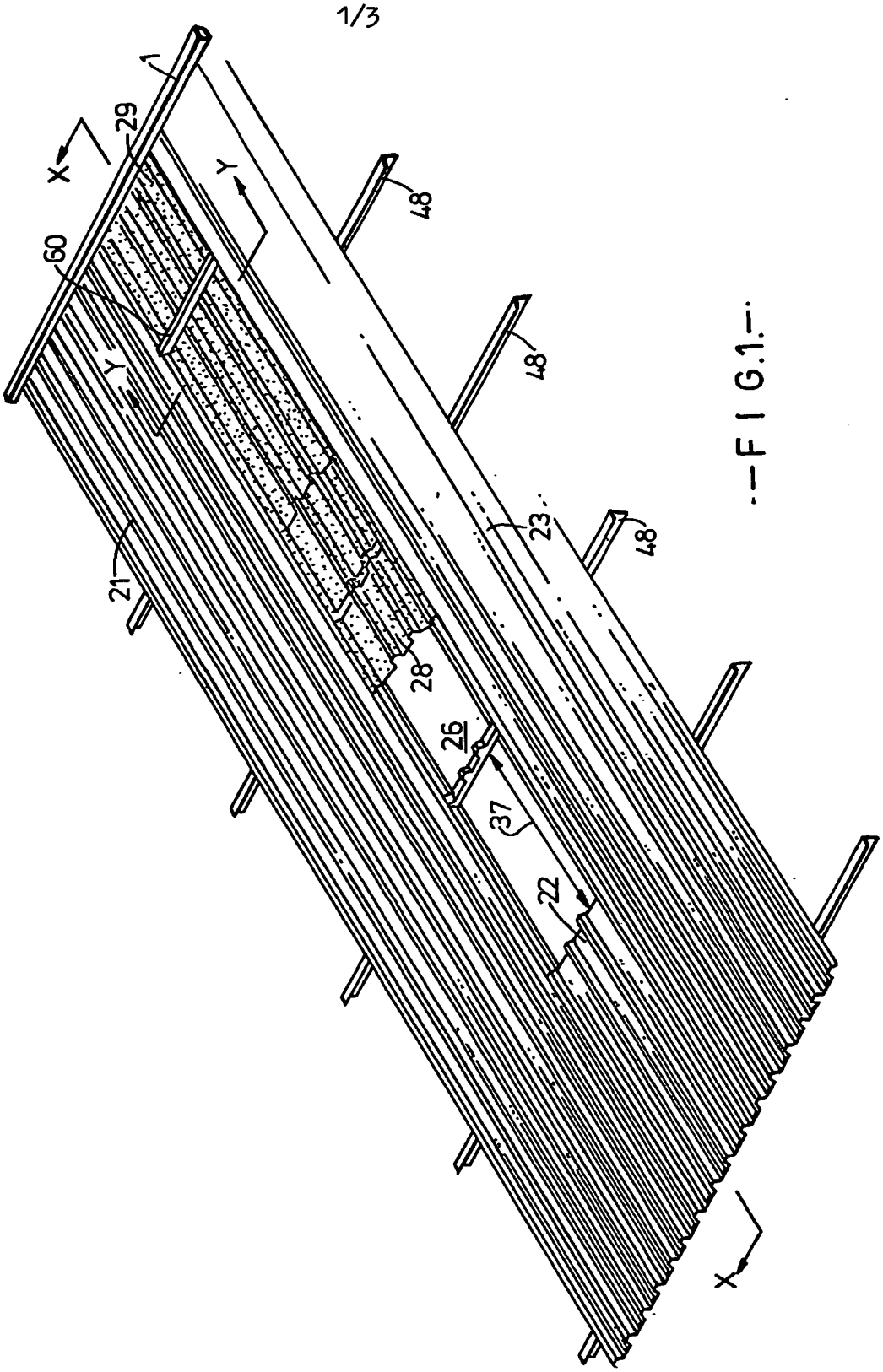

-FIG.1.-

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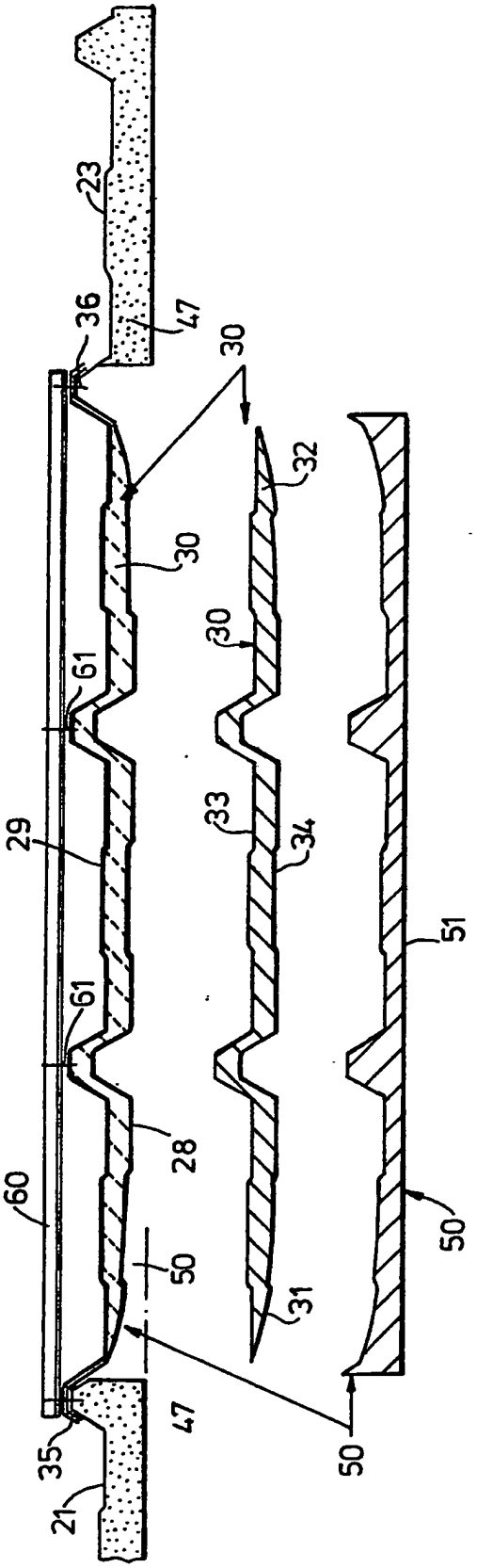

FIG.2.

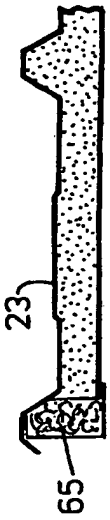

FIG.2A.

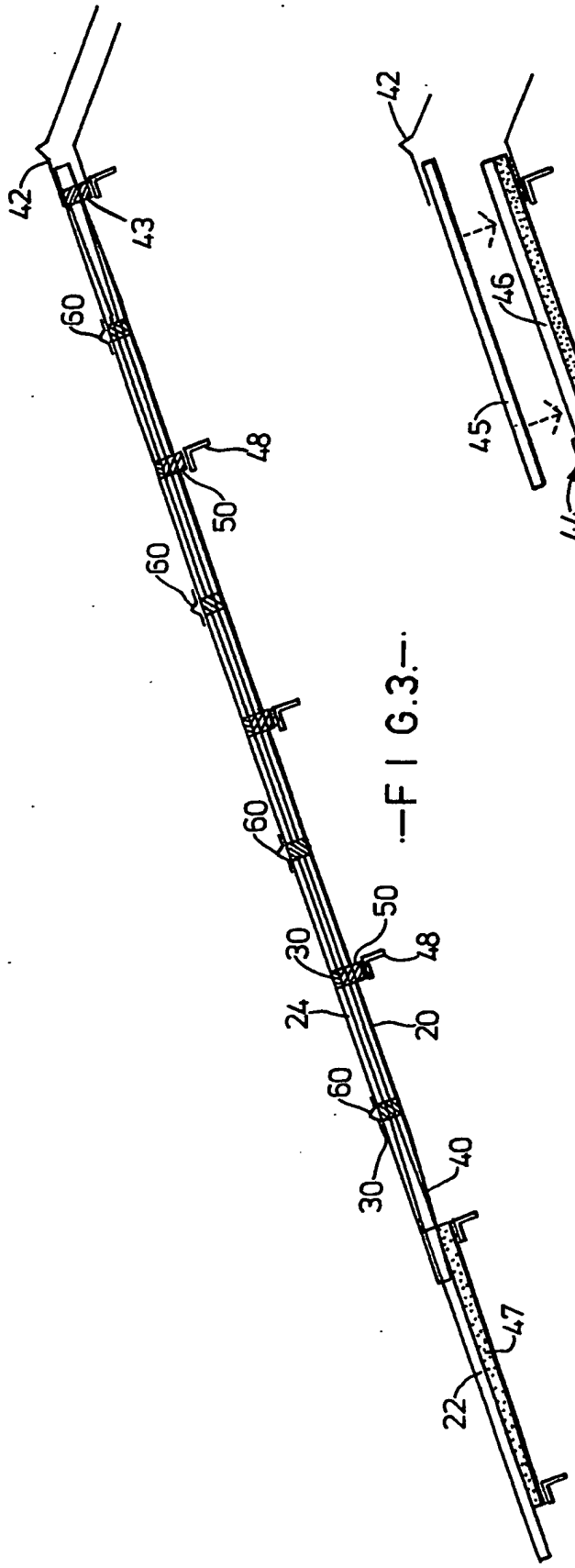

FIG.3.

FIG.4.

SPECIFICATION
Double-layer natural light fittings

The invention relates to double-layer natural light fitting, e.g. for skylights, and especially utilising transparent or translucent plastics sheeting in conjunction with other main cladding sheeting.

It is frequently desired, or required, in order to economise on heating costs, that buildings clad with sheeting, such as our own Triant (Registered Trade Mark) cladding, be provided with lights that are actually, or in effect, double glazed. Transparent or translucent sheeting, rather than a glazed light, is frequently satisfactory at least for a skylight in a roof. However, the economy thus offered is often less than might be expected as acceptable results have normally required pre-fabrication as factory-made sealed units, see, for example, U.S. patent specification No. 3388408 where a dished inner sheet is edge handed and sealed to a corrugated outer sheet. Such units are expensive, at least when brought-in by the cladding contractor.

It is therefore an object of this invention to facilitate the provision of double-layer light fittings, particularly to enable satisfactory on-site assembly and so avoid requirements for complete factory-made units.

To this end we now propose that normal flexibility of so-called rigid or semi-rigid transparent or translucent plastics sheeting be exploited for a gap in main cladding by the use of spacers, so that first and second layers of transparent or translucent plastics sheeting are laid superposed in the gap in generally spaced relation defined by interposed spacers that taper towards their ends whereat one or both layers of the sheeting are flexed toward each other and both secured to or together with the main cladding sheeting edging said gap at its sides.

Preferably at the outer one of the layer of sheeting is profiled to match the main cladding and is laid with its end in lapping relation with the main cladding at ends of said gap transverse to its said sides.

Where both of the layers of said sheeting have the same profile to which said spacers correspond between their end taperings, the spacers are positioned spaced from the ends of the gap, and one or both layers of sheeting are flexed to bring them towards each other at the ends of the gap. It is preferred that all tapering of the spacers be on their bottom profiles in order to achieve good, unflexed lapped fitting of the outer plastics sheeting to the main cladding.

However, the desired spacing of the plastics sheeting plus their thicknesses will most often be less than the overall depth of the main cladding system taken in conjunction with its normal underlying insulation. Thus, it is further preferred that packings be provided having an upper profile matching the bottom profile of said spacers and a bottom profile that serves to match the overall depth of the main cladding system in engaging on roof purlins or other frame members, i.e. will normally be straight or flat.

Preferred systems hereof particularly facilitate on-site fabrication of double-layer natural lights. Thus, a prepared substantially rectangular gap is so fitted by the sequential steps of emplacing packing on purlins or other frame members exposed through said gap; laying an inner plastics sheet on those packings; emplacing spacers on said inner plastics sheet, usually over said packings and preferably also intermediate said packings; and laying an outer plastics sheet over said spacers. The lowermost packing should be spaced from the bottom edge of the gap and the inner plastics sheet flexed into overlapping relation that bottom edge. The uppermost packing is preferably at or near the top edge of the gap and has a said spacer superposed thereon below the inner sheet to promote flexing of the latter into contact with the outer plastics sheet where that is overlapped by said top edge or a weathering member thereover.

We have further found it advantageous to fix deflection limiting bars over the outer plastics sheet and across its width at positions substantially midway between said purlins or other frame members, which positions preferably correspond to spacers located between packers.

The use of spacers as herein proposed maintains insulation spacing over most of the width and length of the light in a continuous manner whilst usefully dividing the air space between the sheets.

One embodiment of the invention will now be specifically described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a fragmentary isometric view, showing a roof light partly broken away;

Figure 2 is a sectional view on the lines Y—Y of Figure 1 and also shows packer and spacer profiles separately;

Figure 3 is a sectional view on the lines X—X of Figure 1; and

Figure 4 shows details useful in explaining variants on Figure 3.

In the drawings, main roof pitch cladding sheeting 21 to 23 is shown defining a gap 26 extending from the roof ridge and to be "double-glazed" using two flexible sheets 28, 29 of transparent or translucent profiled plastics material. The profiles of the plastics sheets 28, 29 are shown as being identical and matching the exterior profile of the main cladding sheeting 21 to 23. The gap 26 may be cut-out from the main cladding or formed between component sheets thereof as implied by our referencing 21, 22, 23.

The two plastics sheets 28, 29 are shown maintained mainly at a desired spacing by means of spacers 30 that, between their end portions 31, 32 have upper and lower profiled edges 33, 34 that match those of the inner and outer sheets 28, 29 respectively. The end portions 31, 32 are tapered, advantageously by a curving of the bottom edge profile only, so that all of the upper edge profile matches the outer plastics sheet 29

but the inner plastics sheet 28 can be flexed to follow the taper of the lower edge end portions to contact the outer plastics sheet 29 at each side beyond the spacers 30 for joint securement to sheeting panels 21 and 23 by conventional means such as bolting or screwing, 35, 36.

The lowermost one of the spacers 30 is in fact spaced (37) from the lowermost edges of the plastics sheets 28, 29 and permits end portion 40 of the sheet 29 to be flexed into contact with the outer sheet 29 to achieve a superposition suited to simple overlapped jointing to the lower cladding sheeting 22.

As shown, the main cladding 21 to 23 is laid over insulation 47 and thus has greater overall depth than the spaced plastics sheets 28, 29. The main cladding 21 to 23 is fitted directly onto purlins 48 or other framing members running transversely of the sheeting. This discrepancy of overall depth for the plastics sheets 28, 29 and the overall depth of the main cladding and insulation 47 is likely to grow as specified insulation thicknesses increase and the gap between the sheets 28, 29 relies upon trapped air for heat and/or sound insulation.

We therefore also show packings 50 to support the inner plastics sheet 28 say by engagement of its lower edge 51 on the purlins 48 or other frame members, or even mere end engagement, say on flanges of rafter beams. The upper edges 52 of the packings 50 follow the profile of the lower edges 34 of the spacers 30 and thus aid on-site assembly work. In fact, the packings 50 have their upper edges 52 extend at 53, 54 beyond the spacers 30 and with a contour that fits the main cladding, the further to aid assembly and sheet bending.

It will be noted that the spacers 30 and packings 50 are desirably superposed at the positions of the latter, i.e. on purlins 48, and of greater width than depth, particularly to contribute to secure holding of the plastics sheeting. Also, of course the spacers 30 and packings 50 will normally be of high density material that resists compaction, but need not lack a small amount of resilience, perhaps comparable with some metals. The spacers 30 and packings 50 may be of high density expanded plastics material, e.g. polyethylene, even fibre-reinforced for strength.

The upper edges of the plastics sheets 28, 29 are shown in Figures 1 and 3 as themselves overlapped by ridge flashing 42 after having been brought together by flexing of the inner sheet 28 over a composite packer 43 comprised of or equivalent to a superposition of one of the packers 50 and one of the spacers 30. Alternatively, upper edges of the sheets 28, 29 can be overlapped by a further main cladding exterior sheet 45 and that, itself, may overly main cladding 46 upon which the sheets 28, 29 are overlapped as at 44.

We have further found it advantageous to emplace spacers 30 also at positions midway between their superposition over packers 50 and purlins 48 and to superpose over the outer sheet 29 at those positions deflection control bars 60. The latter are shown secured to main cladding 21, 23 together with the plastics sheets 28, 29 at 35, 36, and also at 61 through peaks of the outer plastics sheet 29 to the further ones of the spacers 30.

Figure 2A actually shows an option that could be incorporated at the right-hand side of Figure 2 by adding a closure flashing 65 to the main cladding sheets to give a visually attractive finish at sides of the gap 26. Such a flashing 65 may be insulated by an infill of insulation material, say loose mineral wool.

Finally, a preferred erection or fitting sequence is described further to demonstrate how such is facilitated by the present invention. Thus, following preparation of the opening 26 the following operations are performed

(a) Positioning packers 50 one on each of the purlins 48;

(b) Laying the inner plastics sheet 28 on the packers 50;

(c) Positioning spacers 30 on the inner plastics sheet 28 at each purlin 48 and midway between them;

(d) Laying the outer plastics sheet 29 on the spacers 30;

(e) Positioning the deflection control bars 60.

It will be appreciated that top packing 43 will be positioned in step (a) and may have its component parts secured together prior to such positioning.

It is, however, pointed out that the positive transverse location afforded by the profiling of the sheets 28, 29 spacers 30 and packers 50 can be further exploited by delaying drilling for fasteners at least at the purlin positions until after step (d), if not after step (e) though, then, it is usually best to predrill the control bars 60.

Between step (d) and actually fixing the deflection controls bars 60, it is then possible to remove the outer plastics sheet 29 and clear out all swarf between the sheets 28, 29. Then, the outer sheet 29 will be replaced and fastened down through the purlins. Before that, it is also obvious possible to make an initial securement together, for subsequent completion and tightening, of the outer plastics sheet 29 and the deflection control bars and underlying midway spacers 30.

The final step will be attachment of fasteners at the sides of the now double-layer covered gap 26.

Such sequence of fixing and obvious variants therein are clearly well adapted to on-site work and thus economical, flexible and otherwise advantageous compared with using prefabricated sealed units.

It has been found to be satisfactory only to seal the lower plastics sheet 28 to the main cladding, but, obviously, sealer could also be applied between the sheets 28 and 29, if desired.

CLAIMS

1. A method of making a double-layer natural light fitting in a gap in main cladding sheeting of a building, wherein first and second layers of transparent or translucent plastics sheeting at laid

superposed in the gap in generally spaced relation defined by interposed spacers that taper towards their ends whereat one or both layers of the sheeting are flexed towards each other and both secured to or together with the main cladding sheeting edging said gap at its sides.

2. A method according to claim 1, wherein at least the outer one of the layers of sheeting is profiled to match the main cladding and is laid with its end in lapping relation with the main cladding at ends of said gap transverse to its said sides.

3. A method according to claim 2, wherein both of the layers of said sheeting have the same profile to which said spacers correspond between their end taperings, the spacers are positioned spaced from the ends of the gap, and one or both layers of sheeting are flexed to bring them towards each other at the ends of the gap.

4. A method according to claim 3, wherein the layers of sheeting are both laid with the same lapping relation with the main cladding at the ends of the gap.

5. A method according to claim 4, wherein one end of the gap is higher than the other and, the layers of sheeting are laid under the main cladding at the high end and over the main cladding at the lower end.

6. A method according to any preceding claim, wherein only the lower layer of sheeting is flexed when laid.

7. A method according to any preceding claim, wherein the first or inner layer of said sheeting is laid on packings profiled to match the sheeting and lower profiling of the spacers.

8. A method of making a double-layer natural light in a substantially rectangular gap in a main cladding of a roof pitch or wall comprising the sequential steps of emplacing elongate packings on purlins or other frame members exposed through said gap; laying an inner transparent or translucent profiled plastics sheet on those packings whose profiles match the sheet between edge portions whereat the packings correspond to outward flexing of the sheet so that its edges overlie edges of the gap; emplacing spacers on the sheet, such spacers having lower profiles matching the packings and upper profiles matching an outer transparent or translucent profiled plastics sheet; laying a said outer sheet over said spacers and edges of the inner sheet and securing the inner and outer sheets together and to the main cladding of the roof pitch.

9. A method according to claim 8, wherein the spacers are emplaced both in register with the packings and at positions between those packings or other frame members.

10. A method according to claim 9, wherein the inner and outer sheets and spacers with registering packings are all secured to the underlying purlins or other frame members.

11. A method according to claim 8, 9 or 10, wherein deflection limiting bars are fixed across the width of the gap and over the outer sheet at positions substantially midway between the purlins or other frame members.

12. A method according to claim 11 with claim 9, wherein the deflection limiting bars are located in register, and secured to, the spacers located between packings.

13. A method according to any one of claims 8 to 10, wherein the lower end of the inner sheet is flexed outwardly over the main cladding at the bottom of the gap.

14. A method according to claim 13, wherein the upper end of the inner sheet is flexed outwardly against the outer sheet at the upper end of the gap by a said spacer superposed directly on a said packing.

15. A method according to any preceding claim, wherein sealant is applied at contact between sand sheet or sheeting and said main cladding.

16. A method of making a double-layer natural light substantially as herein described with reference to the accompanying drawings.

17. A double-layer natural light made by a method according to any preceding claim.

18. A double-layer natural light according to claim 17, wherein the spacers, and any packings are of high density material that resists compaction.

19. A double-layer natural light substantially as herein described with reference to and as shown in the accompanying drawings.

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